A Letter from Mr. Flamſteed *concerning the Eclipſes of* Saturns *Satellit's for the year following.* 1684 *with a Catalogue of them, and informations concerning its uſe.*

SIR,

THe uſes of the following *Catalogue* of all the *Eclipſes* of *Jupiters Satellits* in the following year extending much further then that of a few only viſible with us, which you were pleaſed to think worthy a place in the *September Tranſactions*; I find my ſelf neceſſitated to give you a larger account both of it, and its Original; which I hope will be as kindly entertaind by you as that was.

It has been my cuſtome for ſome years paſt to make my ſelf quarterly a ſmall *Ephemeris* of the *Eclipſes* of *Jupiters Satellits* viſible with us, that ſo none of them might eſcape me unobſerved when the weather permitted; having by this means obtained a good ſtock of obſervations of them of my own, beſides what I had collected from the Works of *Galileo*, *Hodierna*, *Borelli*, the papers of Mr. *Rooke* late profeſſer of *Geometry* at *Greſham Colledge*, (happily preſerved and kindly imparted to me by his once intimate freind, and one of my honoured *Patrons*, the Right Reverend *Seth* Lord Biſhop of *Sarum*,) and the communications of my honourd freinds and coreſpondents Monſieur *Caſſini*, and Mr. *Towneley*. I found my ſelf well furniſhed, as I thought, for the reſtitution of their motions, which as I have formerly told you I atempted laſt Summer, and accompliſhed with ſuch ſucceſs; that having ſeen only 2 of the prædicted *Eclipſes* of the firſt *Satellit*, I find neither of them differ above 2 Minutes from my calculations. I have alſo obſerved one of the third, not above 3 Minutes faulty, and another of the ſecond erring but two; which makes me hope the in-

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inequality I ſuſpected in this laſt, will not be found ſo large as I feared it might be: after I had finiſhed the *Tables* of their *Mean Motions*, I ſet my ſelf to Calculate others for finding the true times of their return to the *Heliocentrical* Conjunction of ♃ in all places of his *Orbite*, with ſome other which I foreſaw would be requiſite for the eaſie Calculation of their *Eclipſes*: having this in readineſs, and being encouraged with the aforeſaid good ſucceſs, of my endeavours, I reſolved to Calculate all the *Eclipſes* of the following year 1684. and to impart them to the publik, if you conſented, in the Tracts; they being much deſired both at home and abroad, that ſo not only our freinds here, who have a reſpect for Novelties of this ſort, but ſuch forreigners alſo as are Studious of *Aſtronomy* and *Geography*, or thoſe of our own people who Travail into remote Countries, and ſhall be accomodated with inſtruments for this purpoſe, may have the apportunity of foreknowing ſuch appearances, as, if obſerved, will certainly ſhew the difference of *Meridians* betwixt them and us. And I muſt confeſs it is ſome part of my deſign, to make our more knowing Seamen aſhamed of that refuge of Ignorance, their Idle and Impudent aſſertion *that the longitude is not to be found*, by offering them an expedient that will aſſuredly afford it, if their Ignorance, Sloth, Covetouſneſs, or Ill-nature, forbid them not to make uſe of what is propoſed.

Thoſe of them that pretend to a greater talent of Skill then others, will acknowledge that it might be attained by Obſervations of the *Moon* if we had *Tables* that would anſwer her *Motions* exactly; but after 2000 years experience (for we have ſome Obſervations of *Eclipſes* much ancienter) we find the beſt *Tables* extant erring ſometimes 12 Minutes or more in her apparent place, which would cauſe a fault of a half an hour, or 7½ degrees in the longitude deduced by comparing her place in the heavens with that given by the *Tables*: I undervalue not this Method, for I have made it my buſineſs, and have ſucceeded in it, to get a large ſtock of good *Lunar Ob-*

ſervations in order to the correction of her *Theory*, and as a ground work for better *Tables*; but the examination will be a work of a long time, and if we ſhould happily afterwards attain what we ſeek, yet the Calculation will be ſo perplexed and tedious, that it will be found much more inconvenient and difficult then that I propoſe by obſerving the *Eclpſes* of *Jupiters Satellits* which however at preſent I muſt prefer.

For I am perſuaded, that the *Eclipſes* of the firſt will ſcarcely be found above 4 Minutes of time different from my *Calculation* in the *Catalogue*, nor thoſe of the third above twice as much; Now an errour of 4 Minutes cannot cauſe a fault of more then one degree in the *Longitude* collected by comparing an obſerved *Ingreſs* of the firſt *Satellit* into ♃^{s} ſhadow or emerſion from it, with the time given in the *Catalogue*; and I hope it will ſcarce ever be found to err ſo much. But if the ſame *Eclipſe* may be obſerved in two diſtant places at the ſame time, or compared with an obſervation of the ſame *ſatellit* made within a Week elſewhere, the difference of *Meridians* will be had ſomething better then by comparing two obſervations of the ſame *phaſis* of a *Lunar Eclipſe*, made in diſtant places.

For whereas it is ſomewhat difficult by reaſon of the *Penumbra* to determine the true time of the application of either of the *Moons* limbs to the ſhadow, the *Satellits Eclipſes*, eſpecially thoſe of the firſt, are almoſt momentany.

And whereas there can rarely happen 4 *Eclipſes* of the *Moon* viſible the ſame year, thoſe of the *Satellits* happen ſo frequently, that there are more of them viſible in one year then we count days in it, tho the *Planet* ♃ lie hid under the *Suns* raies every year a whole moneth together.

I know our *Navigators* will object againſt this Method, that it is difficult to practice at Sea, becauſe long *Teleſcopes* are required which the Motion of the Ship will not permit them to manage aboard, that it is hard to ſtinguiſh one *Satellit* from another, and that *Tables* or other contrivances for ſhewing their Mutual poſitions are here wanting ; to which I anſwer.

That if it be not practicable at Sea they cannot deny but it is at land ; That the true *longitude* of remote *Coaſts* from us are the firſt thing deſired for the correction of their *Charts* ; let them attempt theſe firſt, and I doubt not but the ſucceſs will encourage them ſo much, that they will readily find means to put it in practice at Sea. That the *French* have uſed this method ſucceſfully both in *Denmark* and their own Country ; That a *Teleſcope* of 14 foot long at moſt, or for need one 8 foot, with broad eye glaſſes, will be ſufficient for this purpoſe; that the dificulty canot be known till it be tried, and that uſe renders many things eaſie which our firſt thoughts conceaved unpracticable.

That the *Satellits* may be diſtinguiſhed by their *Magnitudes*, the third from ♃ being the biggeſt, the firſt ſomething leſs, the ſecond yet leſs than the firſt, and the fourth or outermoſt the ſmalleſt. And to their laſt objection, that if I find this method heeded by them, I ſhall take care to publiſh eaſie *Tables* for finding their *Configurations* and *Eclipſes* in good time. I delay it at preſent on no other account, then that by further *Obſervations* I may get a better knowledge of their Motions, for tho theſe *Satellits* were diſcovered 74 years agone, yet have we no *Obſervations* of their *Eclipſes*, that we may rely on, before *Hodierna's*, and the firſt of his is ſcarce 42 years old as yet : I hope nevertheleſs my preſent *Tables* will not erre ſenſibly for half a dozen years further , and that in the mean time I may give them a further correction by the help of ſuch *Obſervations*, as if God ſpare me life and health, I intend to make, whereby they may be rendred ſerviceable for a much longer time, without any conſiderable faults.

As for the *Catalogue* it ſelf I give in it firſt the *Moneth*, then the day, and to avoid miſtakes I have prefixed the

Planetary Character for the day of the week to each; then the Hour and Minute of the appearance; counted (after the *Aſtronomical* manner from *Noone*, and laſtly the Number of the *Satellit* that is *Eclipſed* with an *i* after it when its ingreſs, an *e* when its emerſion is the appearance obſervable at that time. And that it may be readily known which of theſe are viſible in our *Horizon* I have marked them with a*betwixt the Number and the Letter. Thus in the ſixth line of the *Catalogue* you find ☉6 | 12-29 | 4*i, which ſhews that on Sunday the ſixth of that Moneth at 12^h $29'$ after Noon, the fourth or utmoſt *Satellit* makes its ingreſs, and is *Eclipſed* in ♃'s ſhadow; and the *Numbers* under it | 15-39 | 4*e | that the ſame day 15^h $39'$ after Noone, or that on the 7th day at $3^h 39'$ in the Morning, it again emerges from the ſhadow, and becomes viſible betwixt it and the body, and the * aded to them both, ſhews that both appearances are viſible with us.

If it be required to know whether any one of thoſe inviſible with us be viſible in any other given place. Convert the difference of *Meridians* betwixt it and *London* into time. And if the place lie to the Eaſt of *London*, *add it to*, if to the Weſt, *ſubſtract it from* the time of the appearance at *London*, the Sun or difference accordingly ſhall be the true time of the *Eclipſe* under that *Meridian*, at which if ♃ be above the *Horizon* the Sun beneath it, the *Eclipſe* is there viſible, otherways not.

Or by the help of the *Ephemerides* of the *Planets* places and a terreſtrial *Globe*, the ſpace on it in which any of theſe *Eclipſes* will be viſible may be found thus.

Firſt ſeek the true places of the Sun and *Jupiter* with his Latitude in the *Ephemeredes*, whereby you may find their declinations and right aſcentions either by the vulgar Tables or the Globe it ſelf exactly enough for this Method.

Bring *London* on the *Globe* to the *Meridian*, and detaining it there note what degree of the *Æquator* is cut by it From this ſubſtract the time of the *Eclipſe* after Noon converted into degrees and minutes, the remainder ſhews you the *Longitude* of that *Meridian* on the earth, where it is then Noon when the *Satellit* is *Eclipſed*; which, I therefore call the *Meridional Longitude of the Eclipſe*. Bring this Meridional Longitude under the *Meridian*, and elevate the nearer Pole to the Sun as much as is his declination, keep the Globe in this poſition and if ♃ be in *Conſequence* of the Sun, draw a line on the Globe along the Eaſtern *Horizon*, it paſſes over all thoſe places where the Sun is ſetting at that time, but if ♃ be in *Antecedence* of the Sun, draw the ſaid line on the Globe by the Weſterne Edge of the *Horizon*, it paſſes over all thoſe places where the Sun is then ariſing.

Jupiter being in *Conſequence* of the Sun add the difference of his and the Suns right aſcentions to the *Meridional Longitude* aforementioned, bring the degree of the *Æquator* anſwering their ſumme under the *Meridian*. Raiſe the *Pole* next *Jupiter* equal to his declination, and detaining the Globe in this poſition, draw a line again by the *Eaſtern Horizon*, the ſpace intercepted betwixt this and the line of the Suns ſettings before deſcribed on the *Globe*, Comprehends all thoſe places on the earth from Sun ſetting till ♃ is ſet.

But if ♃ were in *Antecedence* of the Sun, Subſtract the difference of his and the Suns right Aſcentions from the Meridional Longitude, ſet the degree of the *Æquator* anſwering the remainder under the *Meridian*, and elevate the *Pole* next *Jupiter* equal to his declination. Keeping the *Globe* in this poſition draw a line by the *Weſtern* Edg of the *Horizon*, the ſpace included betwixt this, and the line of the Suns riſings contains all thoſe places, on the Earth where this *Eclipſe* is viſible betwixt ♃^{s} riſing and Sunriſe.

When any *Eclipſe* of theſe is obſerved, the difference betwixt the noted time and that in the *Catalogue*, ſhall be the difference of *Meridians* betwixt the place of the obſervation and *London* which lies ſo near the *Meridian* of the *Obſervatory* that the diſtance need not be accounted for. And this determination may be relied on, if the firſt or third *Satellit* were obſerved; but I dare not be ſo confident of the ſecond and fourth for the reaſons formerly given. However I ſhall make it my buſineſs to obſerve all ſuch *Eclipſes* of as many of them as ſhall be viſible with us, that by comparing my obſervations with ſuch as ſhall be made abroad, the error, if any, may be diſcovered and Corrected.

When ♃ is in *Quartile* of the Sun: the diſtance of the firſt *Sattellit* from his next limb when it falls into his ſhadow, and is *Eclipſed*, is one *Semidiameter* of ♃. Of the ſecond, two or a whole *Diameter* nearly. Of the third, three. Of the fourth, five of his *Semidiameters*, or ſomething better when the parallax of the Orbe is greateſt. But theſe quantities diminiſh gradually as he approaches the ☌ or ☍ of the Sun ſomewhat nearly but not exactly in the proportion of Sines.

As the Sun removes from the ☌ of ♃ the *Ingreſſes* of the *Satellits* into his ſhadow become obſervable. When he is about thirty degreees from it, the *Emerſions* of the fourth, and at ſixty degrees of the third begin to be ſeen betwixt the ſhadow and body continuing ſo till the Sun be arrived within ſixty degrees of the ☍ of ♃, when the *Emerſions* of the third fall behind his body, but the *Emerſions* of the fourth continue viſible till he be leſs then thirty degrees diſtant from the ☍ at which time they alſo are hid behind him, all the appearances being made really to the right hand or in antecedence of ♃, tho with inverting *Teleſcopes*, they appear to the contrary, the left.

After the oppoſition of the ☉ and ♃ we begin to ſee the *Emerſions* of all the *Satellits* from the ſhadow, now on the left hand or in conſequince of ♃, but through inverting glaſſes on the right, when the ☉ is neer thirty degrees from the oppoſiton of the Ingreſſes of the fourth, when ſixty degrees from it of the third, begin to be obſervable betwixt the body and ſhadow, continuing ſo till the Sun arrive at the ſame or rather within ſomething a wider diſtance from the ☌ of ♃. Therefore all the *Eclipſes* from the beginning of the year till the ☌ of the *Sun* and *Jupiter* on the twenty ſixth of *February* are made in *antecedence* of ♃ but appear through the inverting *Teleſcope* on the left hand of him, afterwards till the ☍ in *Auguſt* they are made in *Conſequence* but through the ſame glaſſes appear on the right. But when he *Emerges* again from the Sun in *September* they are made, and appear as in the beginning of the year.

After which time the Latitude of the fourth *Satellit* becomes ſo great that it eſcapes the ſhadow and body both of ♃ and ſuffers no more *Eclipſes* by either of them according to my *Tables* this year; it will be therefore worth the while for thoſe who are accommodated with good glaſſes to look for the following *Conjunctions* of the fourth *Satellit* with the *Axis* of the ſhadow, of which that on *November* the nineteenth is viſible with us. For if its Latitude be any thing leſs than I eſteemed, it may be *Eclipſed*.

			d h
The *Conjunctions* of the 4th *Satellit* with the *Axis* of the ſhadow when it ſuffers no *Eclipſes* 1684. are	Octob.	♀	17--07--53
	Nov.	☾	3--01--47
		☿	19--19* 37
	Decem.	♄	6--13--24
		♂	23--07--10

Next

Next year I intend (God willing) to give you the like *Catalogue* with corrections if I find them requiſite, ſomething earlier that ſo our freinds abroad may have timely notice and be incited to mind and obſerve theſe appearances.

J. F.

The *Obſervatory* at *Greenwich*,
Dec. ♂ 18. 1683.

A Catalogue *of the* Viſible Eclipſes *of* ♄ Satellits, *ſhewing the apparent times of their* Ingreſſes *into* ♃ *ſhadow and* Emerſions, *from it under the* Meridian *of the* Obſervatory *in the year 1684. Calculated from new Tables of their* Motions. *by* John Flamſteed *M. R & R. S. S.*

1684															
Jan.	*h* '			*Feb.*	*h* '			*Mar.*	*h* '			*Apr.*	*h* '		
♂ 1	13-03	1 *	i	♀ 1	5 22	2	i	♄ 1	19-24	1	e	♂ 1	18-23	2	e
☿ 2	23-30	3	i	♄ 2	9-47	1 *	i	☾ 3	13-53	1 *	e	☿ 2	16-09	1	e
♃ 3	7-31	1	i	☾ 4	3-36	1	i	♂ 4	7-54	2 *	e	♀ 4	10-38	1 *	e
	19-09	2	i		19-39	2	i	☿ 5	8-22	1 *	e	♄ 5	6-26	3	e
♄ 5	1-58	1	i	♂ 5	22-22	1	i	♀ 7	2-51	1	e		7-42	2 *	e
☉ 6	12-29	4 *	i	♃ 7	6-53	1 *	i		14-24	3 *	e	☉ 6	5-07	1	e
	15-39	4 *	e		19-13	3	i		21-1[illegible]	2	e	☾ 7	23-36	1	e
	20-26	1	i	♀ 8	7-57	2 *	i	♄ 8	21-20	1	e	♂ 8	21-01	2	e
☽ 7	8 25	2	i	♄ 9	0-26	4	i	☾ 10	15-59	1 *	e	☿ 9	18-05	1	e
♂ 8	14-54	1 *	i		3-19	4	e	♂ 11	10-30	2 *	e	♀ 11	12-34	1 *	e
♃ 10	3-36	3	i		11-21	1 *	i	☿ 12	11-19	1 *	e	♄ 12	10-19	2 *	e
	10-22	1 *	i	☾ 11	5-50	1	i	♃ 13	15-13	4 *	e		10-26	3 *	e
	21-42	2	i		21-15	2	i	♀ 14	4-48	1	e	☉ 13	7-03	1	e
♄ 12	4-49	1	i	☿ 13	0-19	1	i		18-25	3	e	♂ 15	1-32	1	e
☉ 13	22-17	1	i	♃ 14	18-47	1	i		23-49	2	e		23-38	2	e
☾ 14	10-58	2 *	i		23-13	3	i	♄ 15	23-17	1	e	☿ 16	0-54	4	i
♂ 15	16-40	1 *	i	♀ 15	10-34	2 *	i	☾ 17	17-40	1	e		3-06	4	e
♃ 17	7-22	3	i	♄ 16	13-16	1 *	i	♂ 18	13-09	2 *	e		20-01	1	e
	11-13	1 *	i	☾ 18	7-45	1 *	i	☿ 19	12-15	1 *	e	♀ 18	14-30	1 *	e
♀ 18	0-16	2	i		23-52	2	i	♀ 21	6-44	1 *	e	♄ 19	12-46	2	e
♄ 19	5-41	1	i	☿ 20	2-14	1	i		22-26	3	e		14-26	3 *	e
☾ 21	0-10	1	i	♃ 21	20-42	1	i	♄ 22	2-28	2	e	☉ 20	18-59	1	e
	13-32	2 *	i	♀ 22	3-13	3	i	☉ 23	1-13	1	e	♂ 22	3-28	1	e
♂ 22	18-38	1 *	i		13-11	2 *	i	☾ 24	19-43	1	e	☿ 23	2-15	2	e
☿ 23	6-27	4	i	♄ 23	15-12	1 *	i	♂ 25	15-46	2 *	e		21-57	1	e
	9-26	4 *	e	☾ 25	9-41	1 *	i	☿ 26	14-12	1 *	e	♀ 25	16-26	1	e
♃ 24	11-19	3 *	i	♂ 26	☌☉♃			♀ 28	8-41	1 *	e	♄ 26	15-33	2	e
	13-06	1 *	i	☿ 27	6-20	1	e	♄ 29	2-26	3	e		18-26	3	e
♀ 25	2-47	2	i	♀ 29	0-55	1	e		5-05	2	e	☉ 27	10-55	1 *	e
♄ 26	7-34	1	i		10-24	3 *	e	☉ 30	3-10	1	e	♂ 29	5-24	1	e
☾ 28	2-0[illegible]	1	i		18-35	2	e		9-09	4 *	e	30	4-51	2	e
	16-05	2 *	i					☾ 31	21-39	1	e		23-53	1	e
♂ 29	21-30	1	i												
♃ 31	14-5[illegible]	1 *	i												
	15-16	3 *	i												

May

1684

May	h '			
♀ 2	18-21	1		e
	19-00	4		i
	21-02	4		e
♄ 3	18-09	2		e
	19-20	3		i
	22-25	3		e
☉ 4	12-51	1	*	e
♂ 6	7-19	1		e
♀ 7	7-27	2		e
♃ 8	1-47	1		e
♀ 9	20-16	1		e
♄ 10	20-45	2		e
	23-18	3		i
☉ 11	2-24	3		e
	14-45	1		e
♂ 13	9-14	1		e
☿ 14	10-03	2	*	i
♃ 15	3-43	1		e
♀ 16	22-11	1		e
♄ 17	23 21	2		e
☉ 18	3-17	3		i
	6-22	3		e
☾ 19	13-05	4	*	i
	14-55	4		e
♂ 20	11-08	1	*	e
☿ 21	12 38	2	*	e
♃ 22	5-36	1		e
♄ 24	0 05	1		e
☉ 25	2-55	2		e
	7-16	3		i
	10-20	3	*	e
	18-33	1		e
♂ 27	13-02	1		i
☿ 28	15-13	2		e
♃ 29	7-30	1		e
♄ 31	1-59	1		e

June	h			
☉ 1	4-30	2		e
	11-14	3	*	i
	14-18	3		e
	20-27	1		e
♂ 3	14-55	1		e
☿ 4	17-47	2		e
♃ 5	7-10	4		i
	8-41	4	*	e
	9-24	1	*	e
♄ 7	3-52	1		e
☉ 8	7-04	2		
	15-12	3		i
	18-15	3		e
	22-20	1		e
♂ 10	16-49	1		e
☿ 11	20-21	2		e
♃ 12	11-17	1	*	e
♄ 14	5-46	1		e
☉ 15	9-39	2	*	e
	19-10	3		i
	22-12	3		e
☾ 16	0-14	1		e
♂ 17	18-43	1		e
☿ 18	22 56	2		e
♃ 19	13 11	1		e
♄ 21	7 39	1		e
☉ 22	1-13	4		i
	2-30	4		e
	12-14	2		e
	23-08	3		i
☾ 23	2-09	1		e
	2-10	3		e
♂ 24	20-36	1		e
♃ 26	1-31	2		e
	15-05	1		e
♄ 28	9-33	1	*	e
29	14 48	2		e
30	3-06	3		i
	4-01	1		e
	6-07	3		e

July	h '			
♂ 1	22-30	1		e
♃ 3	4-05	2		e
	16-58	1		e
♄ 5	11-27	1		e
☉ 6	17-23	2		e
☾ 7	5-55	1		e
	7-04	3		i
	10-05	3		e
♂ 8	19-18	4		i
	20-18	4		e
☿ 9	0-24	1		e
♃ 10	5-41	2		e
	18-52	1		e
♄ 12	13-21	1		e
☉ 13	19-59	2		e
☾ 14	7-50	1		e
	11-03	3		i
	14-03	3		e
☿ 16	2-19	1		e
♃ 17	9-16	2	*	e
	20-47	1		e
♄ 19	15-16	1		e
☉ 20	22-34	2		e
☾ 21	9-45	1		e
	18-02	3		e
☿ 23	4-14	1		e
♃ 24	11-53	2		e
	22-42	1		e
♀ 25	13-27	4		i
	14-07	4		e
♄ 26	17-11	1		e
☾ 28	1-11	2		e
	11-40	1		e
	22 02	3		e
☿ 30	6-10	1		e
31	14-29	2		e

Aug.	h '			
♀ 1	0-38	1		e
♄ 2	19 07	1		e
☾ 4	3-48	2		e
	13 36	1		e
♂ 5	2-01	3		e
☿ 6	8-05	1	*	e
♃ 7	17-06	2		e
♀ 8	2-34	1		e
♄ 9	21-03	1		e
☾ 11	6-25	2		e
	7-32	4	*	i
	8-40	4		e
	15-32	1		e
♂ 12	6-01	3		e
☿ 13	10-01	1		e
♃ 14	19-43	2		e
♀ 15	4-30	1		e
♄ 16	22-59	1		e
☾ 18	9-02	2		e
	17-28	1		e
♂ 19	10-01	3		e
☿ 20	11-58	1		e
♃ 21	22 22	2		e
♀ 22	6-27	1		e
☉ 24	0-56	1		e
☾ 25	11 40	2		e
	19-25	1		e
♂ 26	14-01	3		e
☿ 27	13-54	1		e
♀ 29	0-59	2		e
	8 24	1		e
☉ 31	2-53	1		e

Septembre toto ♃ ſub radijs Solis latet.

1684

Octo.	h '			
☿ 1	7-08	3		i
	21-21	1		i
♀ 3	11-21	2		i
	15-59	1		i
☉ 5	10-18	1		i
♂ 7	0-40	2		i
	4-47	1		i
☿ 8	11-08	3		i
	23-16	1		i
♀ 10	13-58	2		i
	17-44	1	*	i
☉ 12	12-13	1		i
♂ 14	3-16	2		i
	6-41	1		i
☿ 15	15-07	3		i
♃ 16	1-10	1		i
♀ 17	16-33	2		i
	19-39	1		i
☉ 19	14-07	1		i
♂ 21	5-51	2		i
	8-35	1		i
☿ 22	19-04	3	*	i
♃ 23	3-04	1		i
♀ 24	19-08	2	*	i
	21-32	1		i
☉ 26	16-00	1		i
☾ 28	8-24	2		i
	10-28	1		i
☿ 29	23-01	3		i
♃ 30	4-57	1		i
♀ 31	21-41	2		i
	23-25	1		i

Nov.	h '			
☉ 2	17-53	1		i
♂ 4	10-58	2		i
	12-21	1		i
♃ 6	1-58	3		i
	6-49	1		i
♄ 8	0-14	2		i
	1-17	1		i
☉ 9	19-44	1	*	i
♂ 11	13-30	2		i
	14-12	1		i
♃ 13	6-54	3		i
	8-40	1		i
	9·44	3		e
♄ 15	3-07	1		i
	3-46	2		i
☉ 16	21-35	1		i
♂ 18	16-03	1	*	i
	16-04	2	*	i
♃ 20	10-31	1		i
	10·49	3		i
	13-39	3		e
♄ 22	4-58	1		i
	5-18	2		i
☉ 23	23-26	1		i
♂ 25	17·53	1	*	i
	18-34	2	*	i
♃ 27	12-21	1		i
	14·43	3	*	i
	17 32	3	*	e
♄ 29	6-48	1		i
	7-49	2		e

Dec.	h '			
☾ 1	1-10	1		i
♂ 2	19-43	1	*	i
	21·05	2		i
♃ 4	14-10	1	*	e
	18-37	3	*	i
	21-26	3		e
♄ 6	8-38	1		i
	10-20	2		i
☾ 8	3-05	1		i
	23-36	2		i
♂ 9	21-33	1		i
♃ 11	16-00	1	*	i
	22-31	3		i
♀ 12	1-19	3		e
♄ 13	10-27	1		i
	12-50	2		i
☾ 15	4-55	1		i
♂ 16	23-22	1		i
☿ 17	2-06	2		i
♃ 18	17·49	1	*	i
♀ 19	2-24	3		i
	5-12	3		e
♄ 20	12-17	1		i
	15-22	2		i
☾ 22	6 45	1		i
☿ 24	1-12	1		i
	4-36	2		i
♃ 25	19-39	1	*	i
♀ 26	6-19	3		i
	9-06	3		e
♄ 27	14-06	1	*	i
	17-51	2	*	i
☾ 29	8-34	1		i
☿ 31	3-01	1		i
	7-07	2		e

Deſcripſi Dec. 11. ♂ 1683.